PAP2013B

P-Ch -20V Fast Switching MOSFET

V_{DS}=-20V, I_D=-0.7A, $RDS_{(ON)}$=620mΩ

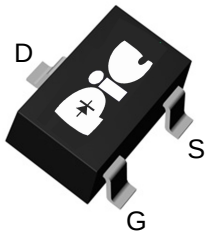
➢ General Description

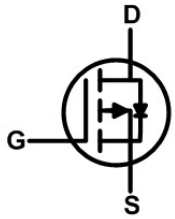
This PAP2013B P-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent Rds(On) performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

➢ Feature

●Low Offset (Error) Voltage
●Low-Voltage Operation
●High-Speed Circuits
●Low Battery Voltage Operation
●SOT-523 package design

➢ SOT-523





➢ Application

●Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
●Battery Operated Systems
●Power Supply Converter Circuits
●Load/Power Switching Smart Phones,Pagers

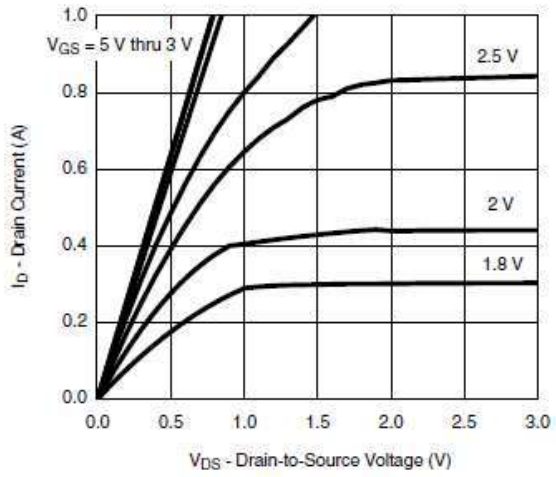
➢ Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	-0.7	A
	T_A=70℃		-0.4	
Pulsed Drain Current		I_{DM}	-1.0	A
Continuous Source Current(Diode Conduction)		I_S	-0.3	A
Power Dissipation	T_A=25℃	P_D	0.27	W
	T_A=70℃		0.16	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃

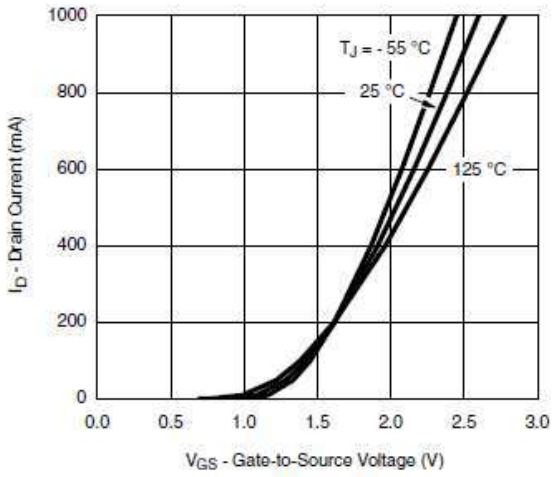
➢ Electrical Characteristics (T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V			-1	uA
		V_{DS}=-20V,V_{GS}=0V T_J=85℃			-5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧ 5V,V_{GS}=4.5V	0.7			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-0.6A		500	620	mΩ
		V_{GS}=-2.5V,I_D=-0.5A		700	860	
		V_{GS}=-1.8V,I_D=-0.4A		1000	1450	
Forward Transconductance	g_{FS}	V_{DS}=-10V,I_D=-0.4A		1		S
Diode Forward Voltage	V_{SD}	I_S=-0.15A,V_{GS}=0V		0.65	1.2	V
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V f=1MHz		70	100	pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	V_{DS}=-10V,V_{GS}=-4.5V I_D≡-0.25A		1.0	1.3	nC
Gate-Source Charge	Q_{gs}			0.1		
Gate-Drain Charge	Q_{gd}			0.3		
Turn-On Time	$t_{d(on)}$	V_{DD}=-10V,R_L=30Ω I_D≡-0.2A,V_{GEN}=-4.5V R_G=10Ω		10	15	ns
	t_r			10	15	
Turn-Off Time	$t_{d(off)}$			40	60	
	t_f			30	50	

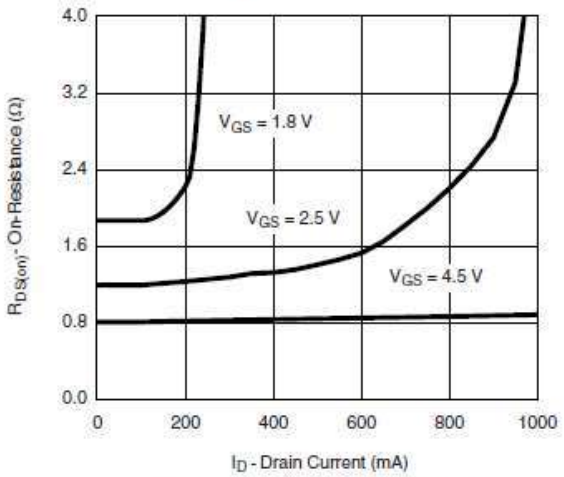
➢ Typical Characteristics



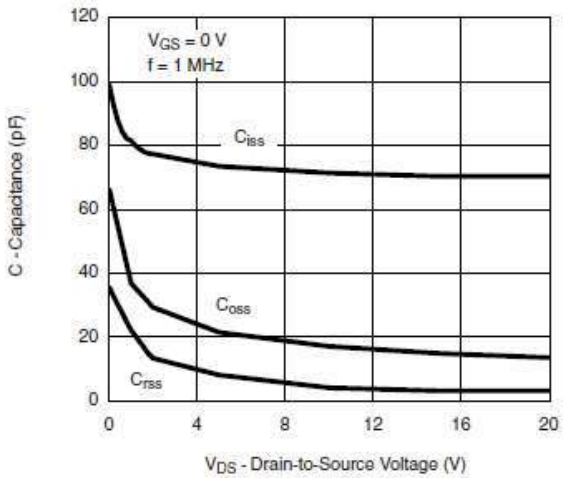
Output Characteristics



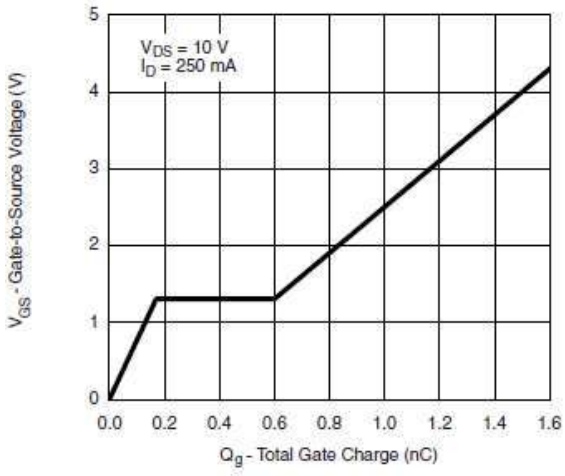
Transfer Characteristics



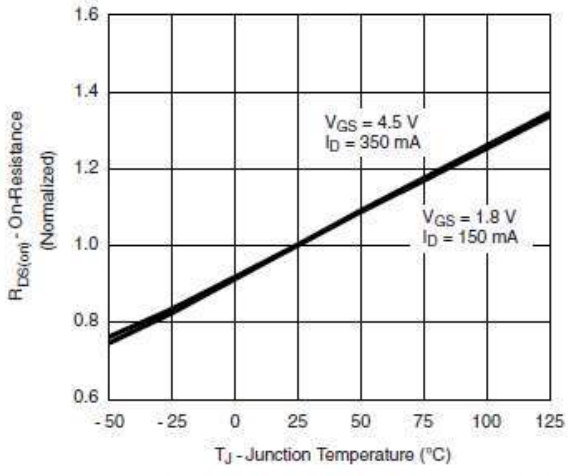
On-Resistance vs. Drain Current



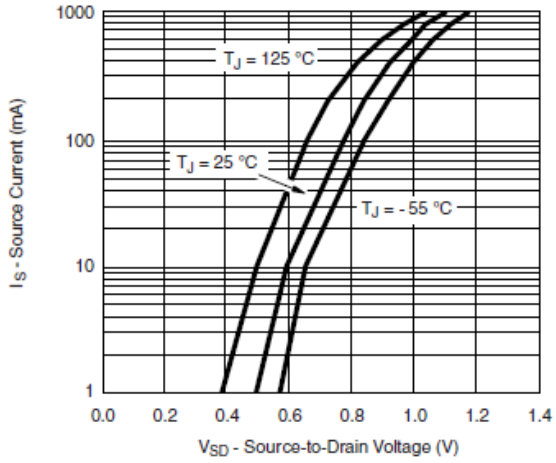
Capacitance



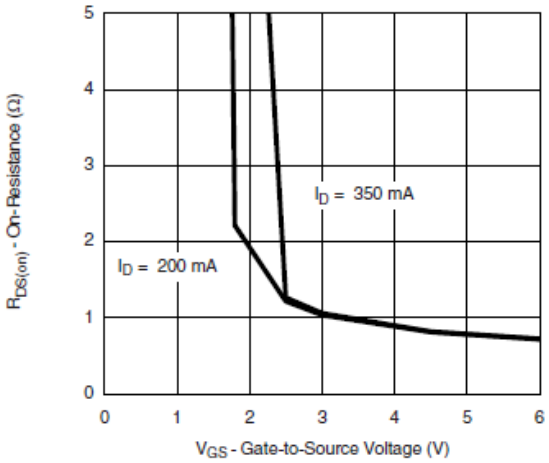
Gate Charge



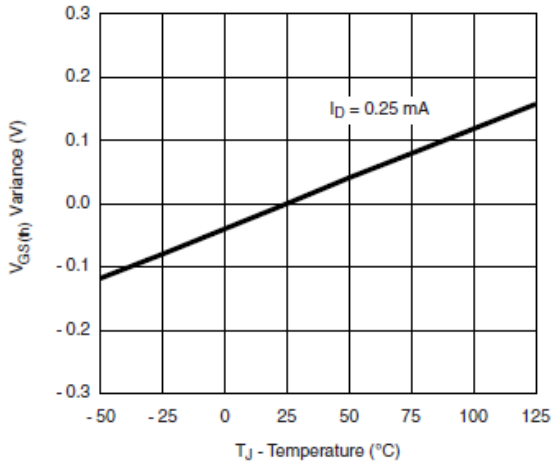
On-Resistance vs. Junction Temperature



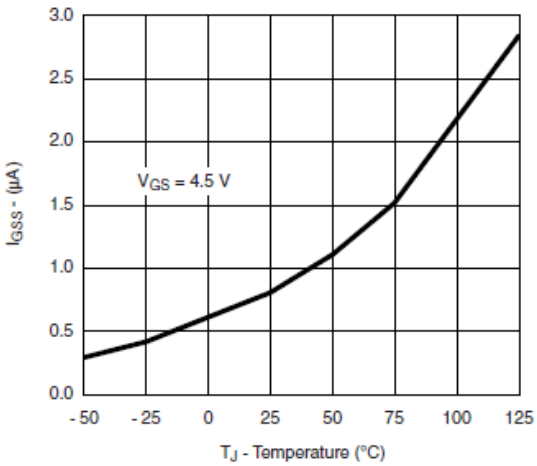
Source-Drain Diode Forward Voltage



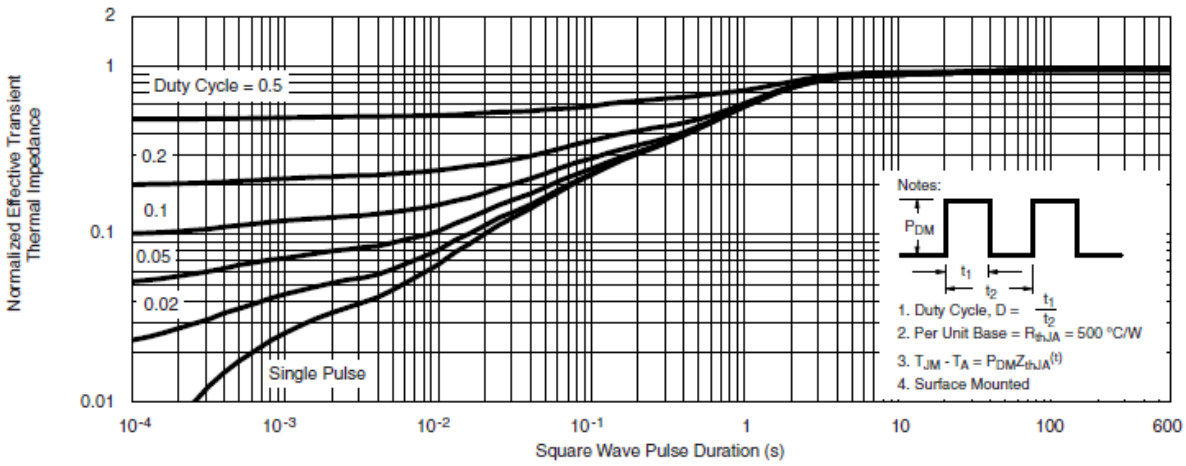
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage Variance vs. Temperature

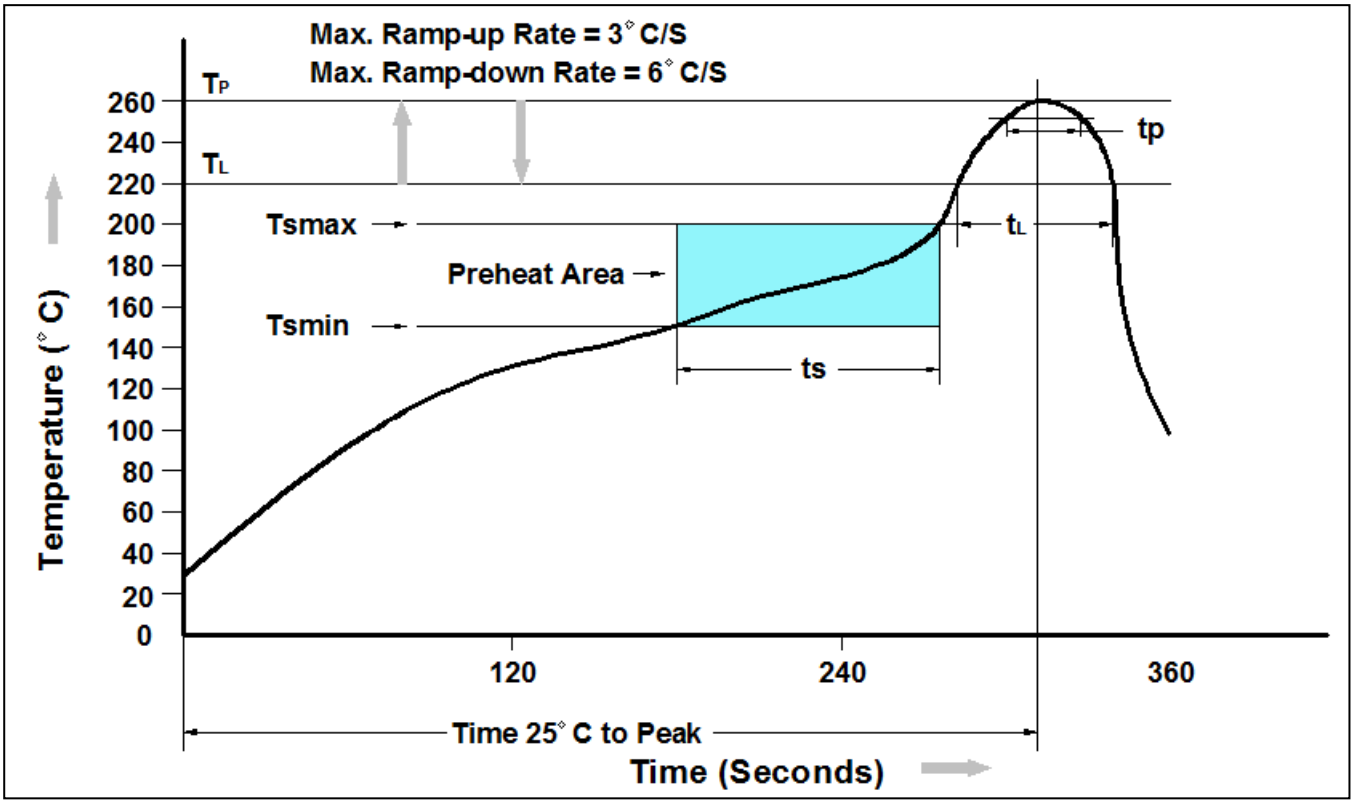


I_{GSS} vs. Temperature



Normalized Thermal Transient Impedance, Junction-to-Ambient

➢ Recommand IR Reflow Soldering Thermal Profile

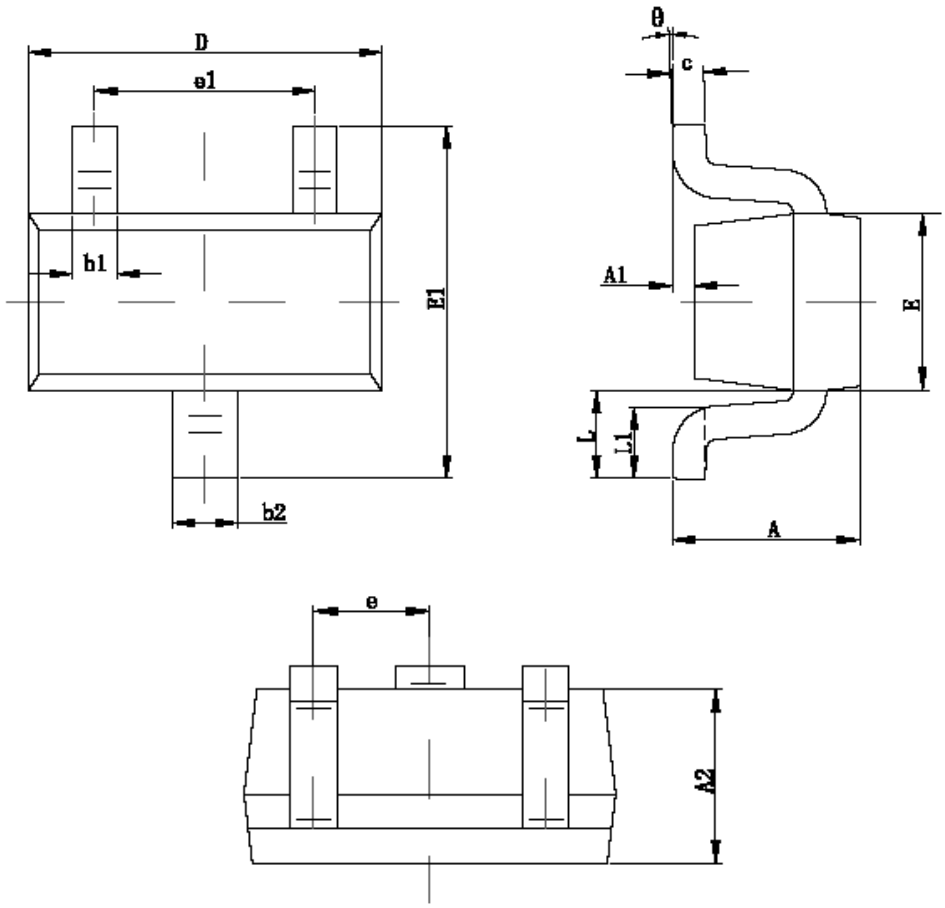


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➢ Ordering Information

Part Number	Description	Quantity
PAP2013B	SOT-523 Reel	3000 pcs

➢ Package Information (SOT-523)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.325	0.010	0.013
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.750	0.850	0.030	0.033
E1	1.450	1.750	0.057	0.069
e	0.500 TYP		0.020 TYP	
e1	0.900	1.100	0.035	0.043
L	0.550 REF		0.022 REF	
L1	0.280	0.440	0.011	0.017
θ	0°	4°	0°	4°

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